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Overpriced Mergers and Acquisitions in the Chemical Industry

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Abstract

Overpriced Mergers and Acquisitions in the Chemical Industry

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Mergers and acquisitions within the chemical industry is a common practice to increase market presence and customer base. Common justifications for M&A include synergy, business growth and competitive advantages, and management reasoning. Synergies are benefits a combined firm is able to receive through cost reductions, market expansion, and efficiencies in processes. As a result, firms are able to grow and position themselves competitively. To prevent an overpriced acquisition, numerous valuation techniques exist. The discount cash flow examines the value of a firm based on future cash flow. The market multiple compares target firms to similar firms in the industry. Lastly, the asset valuation determines the value of a firm based on the liquidation of the firm.

To maximize the return on an acquisition, proper due diligence should be conducted based on the needs and goals of the purchaser, and the value added by the

target firm. The premium paid for an acquisition should be based on the valued added through the synergies identified. Current business cycles and future outlook should also factor into the pricing of the acquisition. Having a thorough analysis of a target firm can help the acquirer to clearly understand what is being purchased and hence, determine an appropriate price for the acquisition.

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In a globally competitive market, corporations are finding it difficult to create value through new products and services. Competition has created an environment which demands shorter production time and reduced cost. As a result, corporations are struggling to maintain a level of competitive advantage through their capabilities and expertise. In an attempt to maintain the necessary competitive advantage, firms are looking towards mergers and acquisitions (M&A) as the mean for growth and value. Through such measures, firms are able to reinforce existing capabilities and access new skills.

The purchase price of a target firm should be based on the value added through the merger. The value realized in an M&A depends in large part on how well the newly combined company identifies, manages, and executes on value creation and value capture opportunities (PricewaterhouseCoopers 2008). However, it has been stated that as many as 70% of M&A's fail to capture the added value and hence, produce the value shareholders expect (Greenberg et al 2008). Different valuation techniques are available to help determine an appropriate price for an acquisition however, there are numerous reasons why firms often overpay for an acquisition including irrational exuberance about the strategic importance of the deal, and enthusiasm built up during the excitement of negotiations (Eccles, Lanes, and Wilson 1999). Understanding the justifications for firms' decision to engage in an M&A and the different valuation techniques available can inform and prevent firms from an overpriced acquisition.

This research will attempt to determine some of the reasons for undertaking an acquisition and the valuation processes available to determine an appropriate purchase price. The remainder of the paper will begin by examining the justifications for an (overpriced) M&A and studying the common valuation techniques used in M&A. An analysis will be presented for investors and managers within the chemical industry on factors beneficial for a successful M&A. Information regarding the research methodology will then be presented, and concluded by a review of the main points, recommendations for firms considering an M&A, and recommendations for further research.

JUSTIFICATIONS FOR MERGERS AND ACQUISITIONS

According to Amin et al. (2001), rapid changes in technology, competitive environment, corporate strategies, and other pressures prompt many firms to seek cooperative relationships with other companies. Past mergers have shown that high level of optimism exists concerning the magnitude and timing of capturing synergies and operational savings. Incorrect assumption can pose liquidity issues and reduce the net present value of the acquisition (Roman 2009). Justifications for M&A should closely align with the company's business and should be based on the risks and future goals of the combined firm. Common reasons for engaging in M&A include synergy, business growth and competitive advantages, and management decision-making. Understanding these reasons can shine light on the biases of these reasons.

Synergy

Synergy is defined as two agents working together such that the value as a whole is greater than the sum of its parts. It is generally used to describe the benefits a merged company receives which it could not otherwise achieve independently. Synergy is often the primary motive for M&A as it leads to increased competitiveness and cash flows (Mukherjee, Kiymaz, and Baker 2004). Executives often use synergy to justify a deal and for the excessive premium paid however, they set themselves up for problems as they attempt to define, capture, and track synergies in the deal (Ficery, Herd, and Pursche 2007). Figure 1 provides a graphical representation of the various values a firm holds.

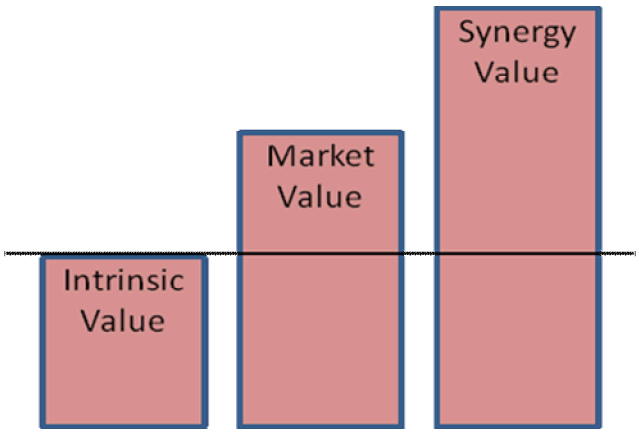

Figure 1: Different values for a given firm

The intrinsic value of a firm is the net present value of expected future cash flow. This value is independent of any acquisitions and is under the assumption the firm continues to operate as normal. The market value of a firm reflects the added premium likely offered by a potential acquirer to the target company. For a publicly traded company, this value is also the share price. The synergy value is the net present value of

future cash flows resulting from improvements and added benefits from two firms coming together (Eccles, Lanes, and Wilson 1999). In other words, the synergy value paid is the premium over the market value for the synergy created between the firms.

The premium paid for the acquisition of a company should be based on the expected synergies. As a result, management should carefully determine and value all possible synergies arising from the merged company. Synergies such as eliminating duplicate work, consolidating activities, and reducing headcount are easily identified and captured. However, management frequently fails to realize the less easily defined synergies. These include revenue synergies resulting from improvement in processes and joint efforts (Ficery, Herd, and Pursche 2007). Consider a company trying to access a new geographic market and a new customer base. The time and costs associated with such an implementation can be substantially reduced through M&A. The value of this synergy would be the time and costs involved to enter a new geographic market independently. Other intangible synergies include outcomes from knowledge sharing, joint research and development, and boarder and deeper scope of the company (Amin, Hagen, and Sterrett 1995). These synergies are harder to monetize as they become drivers for additional value to the company.

Capturing synergies does present some challenges including the window opportunity to capture synergies and incorrect processes. The window opportunities to capture synergies tend to be time sensitive, and research shows that successful acquirers capture 70-75% of the synergies during the first year after the close of the deal (Ficery, Herd, and Pursche 2007). The focus on capturing synergies is lost over time, which leads executives to wait until another acquisition to capture the remaining synergies. As time

destroys the value of synergies, executives continue to focus their attention on capturing the easiest, least significant synergies first. As a result, capturing the true value adding synergies is delayed and the overall integration timeline is extended (Kissel, McCoy, and Charles 2009). Best practice states that synergies should be prioritized based on the size, time, and difficulty in capturing the synergy. Afterwards, work must be done to capture the biggest and easiest synergy in the least amount of time. In the merger between two specialty chemical companies, this process allowed synergies to be captured 20% sooner and capture $85 million in synergies over and above the estimated $200 million target (Ficery, Herd, and Pursche 2007).

Incorrect processes can lead to unattained synergies. It is not enough to just find synergies, but a process must be available to monitor the success of capturing the synergies. Leading organizations use a strategic due diligence to identify, valuate, and prioritize synergies to handoff to integration teams. The integration teams then focus on achieving the synergies utilizing tracking mechanisms linking synergies to financial plans and timetable (Ficery, Herd, and Pursche 2007). Attempting to capture synergies through economies of scale and operational efficiencies from sharing best practices can prove difficult for corporate cultures which lack processes tied to a financial metric system. In such instance, companies must leverage existing measurements systems, i.e. budgetary and financial goals, to monitor the synergies captured.

Synergies are the often the primary justifications for M&A. Careful attention should be given to determine all possible synergies to justifiably pay the necessary premium to close the deal. Synergies should be identified, valued, and captured based on

size, time, and difficulty in reaching the synergies. It is then that a merged company can maximize its strengths and capabilities.

Business Growth and Competitive Advantages

Business growth and competitive advantages are another common reason to pursue M&A. The combined firm allows its business portfolio to expand its main line of business while achieving a lower cost of capital (through lower level of risks) and higher operating cash flows (Katz, Simanek, and Townsend 1997). The business and competitive advantages can be realized through different means including revenue and market growth, cost reduction, and capital optimization.

In a competitive environment, internal or organic growth is often difficult to achieve. M&A allows the purchaser to receive additional revenue and market growth by entering new markets and expanding into new geographies. In addition, firms have access to new distribution channels and customer base, and have an opportunity to gain a stronger foothold in an industry which it may not have been able to do internally (Hunt, 2003). Combining firms from different industries allows the combined firm to enter into new markets with greater growth potential. Merging within similar industries allows firms to gain economies of scale and scope.

Economies of scale refer to the competitive advantages resulting from operational efficiencies. This theory states that a joined company can reduce its fixed costs by removing duplicate activities and headcounts and lowering the overall cost from R&D through production while providing a constant, if not increasing, revenue stream. Joint

R&D and production effort, and marketing allow firms to benefit from the economies of scale (Amin, Hagen, and Sterrett 1995). Less evident synergies include cross-selling of products in newly assessable market segments (Pursche, 1989). Economies of scope refer to the competitive advantages from the transfer of skills and knowledge at a lower cost than if pursued independently. This advantage provides companies access to new technology, greater brand awareness and reputation (Katz, Simanek, and Townsend 1997).

Merged firms also benefit from the reduced operational cost and improved operational efficiency. The obvious cost reductions are from the removal of duplicate headcount and activities. Cost savings also occur from economies of scale and purchasing power through volume discount. M&A provides the opportunity to achieve operational efficiency as competitive advantages are achieved through the transfer of skills to critical activities. One of the main reasons for M&A's during the 1990s was the notion of knowledge-based competition allowing for faster and cheaper advancements through knowledge transfer (Katz, Simanek, and Townsend 1997).

Lesser recognized business growth and competitive advantage relates to capital optimization. Firms are better able to utilize resources to maximize profits by combining uses of resources and closing duplicate or expensive facilities. This in-turn will provide additional cost savings to the company. M&A also provides firms a fitting occasion to streamline the human capital for improved operational efficiencies. However, care must be taken to ensure there is no misalignment between the business and the workflow strategy – ultimately resulting in diminishing value in the M&A deal.

Management Decision-Making

Management is constantly seeking out new opportunities to increase revenue and to grow the company. In doing so, senior managers should rigorously examine the emotional state of those supporting the deal and the reasoning provided to support the deal. Studying a potential deal requires extensive time and effort that can create an emotional attachment. Many deals often happen because managers fall in love with the idea of the deal (Eccles, Lanes, and Wilson 1999). An emotional attachment can result from over commitment to the deal or when a manager personally is responsible for the acquisition decision.

Over confidence also comes into play with managers of competitive nature. These individuals are certain in their judgment which leads them to value the target firm too positively – expecting significant synergies and benefits from the merger. Industry trends and market performance will also influence management to consider M&A as a necessity (Reilly 2007). Managers often over-credit their role in previous successful deals which leads to subsequent value destroying deals (Billett and Qian 2008). To overcome these biases, management should seek out disconfirming evidence from objective experts and independent analysts, and from references of comparable prior deals. This will help justify the validity of the deal. The competitive nature also makes it difficult for managers to lose, especially during a bidding war with a rival competitor over a target firm (Eccles, Lanes, and Wilson 1999). As a result, the purchase price is unjustifiably increased as managers are un-willing to be outbid. In the end, managers will possess the winner's curse as their ego will have led them to pay an unreasonable premium for the target company. However, management will justify the higher-than-

expected premium as a "strategic investment." This is the excuse used to justify an overpaid acquisition when the numbers do not add up (Eccles, Lanes, and Wilson 1999).

Another common argument to pursue a target firm is to prevent a competitor from acquiring it. The fact remains that the purchase of a firm should be based on the value added in relation to the cost of the acquisition (Eccles, Lanes, and Wilson 1999). Therefore, if the calculated benefits are outweighed against the cost of the purchase, the purchaser should avoid placing itself in a weak competitive position by purchasing a less-than favorable target firm.

The decision to merge or acquirer another firm should be based on reasonably estimated benefits and value added to the buyer. The decision should consider all attainable synergies and benefits as well as the financial and business costs associated with the acquisition.

VALUATION TECHNIQUES

Pricing an acquisition correctly is critically important provided the numerous M&A's which take place and the high failure rate to capture the expected value from synergies and competitive advantages. Moreover, many assume that companies have an absolute value but the strategic value of purchasing another firm is inherently relative given factors as market position of the buyer and competitiveness of the products it is acquiring (Seymour 1993).

Value is often characterized as being dynamic, changing based on the context it is used in. The basic value of a company is its intrinsic value. This is the value based on

the net present value of future cash flow independent of any changes. This is under the assumption that the company continues to operate under current management and processes (Eccles, Lanes, and Wilson 1999). On top of the intrinsic value is the premium added to reflect the likelihood of an acquisition (Bertoncel 2006). This is the market value. Lastly, the synergy value refers to the target firm's value as a combination of all benefits arising through the M&A.

Valuation analysts often disagree on what quantitative value constitutes fair market value. However, it should be mentioned that paying more than "fair market value" does not equate to overpaying (Reilly, 2007). Purchase price should be relative to similar M&A's in the industry as well as the value added to the combined firms. Each potential buyer will estimate the value of the acquisition given the post-merger financial projections and the buyer's required rate of return. Benchmarks to determine the purchase price of the target firm are 1) pay a price up to the amount where the target acquisition internal rate of return (IRR) equals or exceeds the buyer's cost of capital and, 2) a price up to the amount where the target acquisition net present value (NPV) equals or exceeds zero (Reilly 2007, and Bertoncel 2006).

Numerous valuation techniques have developed to estimate a target's value. There are three primary approaches to valuing a company: income approach, market approach, and asset approach. Within these approaches various methods have evolved with unique characteristics. All three approaches should be used in business valuation but, doing so may not be practical in certain situation. Each approach may present constraints but it is important to recognize that each approach brings a unique perspective on value and its driver. The income approach looks at future return discounted to reflect

the associated risks. The market approach determines the value based on alternative investments, and the asset approach approximates the business valuation during liquidation (Evans and Bishop 2001). Three commonly used valuation techniques used are the discount cash flow (DCF), market multiple, and asset valuation. Using these techniques together will allow decision-makers to make an informed purchase offer.

Discount Cash Flow

Over time researchers have found increasing use of the DCF models in various corporate decision making environments and as a dominant investment-evaluation vehicle. Greater importance is placed on this model as compared to the alternatives including market multiple and asset valuation (Mukherjee, Kiymaz, and Baker 2004). According to surveys conducted, firms primarily use the DCF model to determine the value of the target take-over.

In M&A's, the discount cash flow valuation technique attempts to determine the net present value of future cash flow over the life of a company. Since companies are assumed to have infinite life, the DCF valuation is captured from the cash flows during the initial forecast period and the terminal period (Bertoncel 2006). For the initial forecast period, cash flow estimates are projected which incorporate the benefits and costs associated with the transactions. The initial forecast period generally refers to the first three to ten years after the M&A. The terminal period of the company refers to the period beyond the initial period, and the terminal value, or residual value, refers to the value of future cash flow during the terminal period (Chaplinsky and Doherty 2000, and

Pratt, Reilly, and Schweihs 2000). Once the cash flows have been approximated, the Weighted Average Cost of Capital (discount rate) is used to discount them to present value. This is the business enterprise value.

Cash flows are represented as the cash the companies has after all cash expenses have been taken out; it is the operating cash flow before the consideration of finance charges. Cash flow equals after-tax earnings, plus depreciation and other non-cash charges, less net investments and changes in working capital. Cash flow can be determined by taking the net profits and adding back depreciation and non-cash charges, and subtracting capital expenditure and changes in working capital (current liabilities minus current assets) (McClure 2009). Once the cash flow is determined for the initial period, they are discounted to the present value.

Present Value = $\sum_{i-1}^{n} \frac{CF_i}{(1+WACC)^i}$, where:

- *CF* is the expected cash flow for the period ahead.
- *WACC* is the weighted average cost of capital

Terminal values are calculated in the final year of the initial forecast period, and discounted to the present value. Various methods exist to calculate the terminal value. The liquidation value assumes that a firm will cease to exist at the end of the initial period. This approach simply determines the value of the firm's total assets adjusted for inflation. The stable perpetual growth model assumes that a firm will grow at a constant rate, and the multiple growth valuation applies a multiple to a firm's revenue. For this research, focus will be placed on the stable perpetual growth model. The following formula calculates the terminal value:

Terminal Value = $\frac{CF(1+g)}{WACC-g}$, where:

- *CF* is the expected cash flow at the end of the initial forecast period.
- *WACC* is the weighted average cost of capital
- *g* is the expected constant growth rate in the perpetual period.

It is important to note that the present value of the terminal value often times accounts for a large portion of the firm's value. As a result, small changes in the growth rate will greatly change the terminal value. As the growth rate gets closer to the discount rate (WACC), mathematically, the capitalization rate is zero or negative. This leads to an unreasonable conclusion that the company is infinitely valuable (Pratt, Reilly, and Schweihs 2000).

Discount rate is an "opportunity cost" or the expected rate of return an investor would have to give up in investing in similar business given the risks; it is the rate of return which the market requires to attract investments. In an M&A, the discount rate should reflect the entire capital structure of the target firm (Pratt, Reilly, and Schweihs 2000). Businesses are usually financed through debt and equity with corresponding costs given the risk factors. Therefore, the discount rate must reflect the combined weighted average cost of all capital sources.

WACC = $W_d k_d$ (1 - T) + $W_e k_e$, where:

- W_d and W_e are the percentage of debt and equity, respectively.
- *T* is the marginal tax rate.

- k_d and k_e are the cost of debt and equity, respectively.

The cost of debt is frequently the yield to maturity given similar credit rating and maturity. The cost of equity can be determined using the Capital Asset Pricing Model (CAPM).

$k_e = R_f + \beta (R_m - R_f)$, where:

- R_f is the risk-free rate on a given security (usually defined as the ten year government treasury).
- $R_m - R_f$ is the risk premium for similar investments.
- β (beta) is measure of a firm's systemic risk.

Once the cash flows during the initial forecast period and the terminal/residual values are determined, these values will need to be adjusted to the present value with the appropriate WACC. The summation of these values will provide the intrinsic value of a company.

Market Multiple

Market multiples is a widely used source to determine the value of a firm during an M&A. It is based on the notion that one will not pay more than the price of equally available alternatives. Thus, market multiples are based on similar companies within the industry. The challenge therefore is to identify similar companies to provide a basis for comparison. Depending on the characteristic and nature of the firm, it may be difficult to find comparable companies. As a result, the search criteria will need to be broadened to find suitable companies for comparisons. Frequent search criteria are based on size (as

defined by sales volume), specialty of products and services, markets and geographic presence, and financial performance (Evans and Bishop 2001). Various multiples are available to apply against the target company. Attention should be given to the market value of invested capital (MVIC) as defined by the price of equity and total debt (enterprise value). Market multiples use various return measures including revenue, EBIT (earnings before interest and taxes), EBITDA (earnings before interest, taxes, depreciation, and amortization), and operating cash flow; typically multiples are based on the last twelve months of earnings. Ratios of enterprise value to the different measure of returns are computed for the comparable companies. These ratios should be arranged to provide a spectrum of small to large ratios to provide a valuation range for the target firm. These ratios can then be applied against the revenue, EBIT, EBITDA, operating cash flow, or any other measure of the target firm. This will provide valuation ranges based on the different measures used.

Consider the present pending M&A deal by CF Industries Holdings to acquire Terra Industries. The market multiple for Terra Industries can be determined by examining the returns of a similar company within the industry such as Scotts Miracle-Gro Company. In November 2009, Scotts Miracle-Gro had an enterprise value of $3,658,686,000 and an EBITDA of $347,400,000 (SmartMoney 2009). Thus, the market multiple for Scotts Miracle-Gro was 10.53 (enterprise value/EBITDA). Applying this market multiple against the EBITDA ($500,481,000) for Terra Industries provides a market valuation of $5.27 billion. This is near the vicinity of the latest $4.1 billion offer by CF Industries for Terra Industries.

While using the market multiples, it is important to analyze the weight given to these multiples, and which measure to use in determining the market value. Limited data may lead to placing little significance on the multiple, or using other measures of return. Similarly, data comparability may subject an analyst to adjust multiples to compensate for the differences between target firm and similar companies (Pratt, Reilly, and Schweihs 2000). Data which are closely clustered or widely dispersed will provide market trends and indicate which measure to use. The popularity of relative valuation comes from its simplicity and the availability of data (Bertoncel 2006). The benefit of using such method is the analysis of the operations of similar companies in the industry, as well as the drivers of risk and value for the companies. With this information, an accurate valuation can be reached relative to the competition (Evans and Bishop 2001).

Asset Valuation

The asset based valuation approach is used when a buyer is primarily interested in the tangible and non-tangible assets of a company. In the asset valuation approach, all of the firm's assets and liabilities are reevaluated and applied a fair market value. Fair market value is defined as the price an individual is willing to pay for similarly available alternatives. Accounting book value is not a recommended business valuation technique. It is typically incorrect to value a business based on accounting values since it usually is not representative of current economic value (Pratt, Reilly, and Schweihs 2000). Once every asset and liability has been evaluated, the sum of the liabilities can be deducted from the sum of the assets to provide the value of the business enterprise.

Starting with the balance sheet of the company, every asset and liability will need to be restated at fair market value; this may require appraisals for the corresponding disciplines. Tangible assets which have been fully depreciated may still have economic value if they still have remaining usefulness. Off-balance sheet liabilities will need to be recorded, although this is usually less common as firms do not have contingent liabilities. In addition, intangible assets will need to be recorded which may or may not have been included in the balance sheet. These include leasehold estates, rights, patents, and trademarks. These intangible values can be valued using the income-based approach, estimating the income capitalization from the use, forbearance, license, or rental of the intangible assets (Pratt, Reilly, and Schweihs 2000). Similarly, the market approach can be utilized to compare with similar intangible products sold/licensed in the primary or secondary markets. The income-base and the market approach can be used to determine the market value for tangible and intangible assets. Once all assets and liabilities are recognized and valued, it is simply a matter of subtracting the liabilities from the assets to realize the business value of the firm.

The advantage to using the asset based valuation approach is that it itemizes the business's assets and liabilities. Thus, this method identifies which assets are contributing to the economic value of the firm, and the degree to which these assets provide value. In addition, this method can quantify the effect of the business decision pertaining to the purchase of any or all assets (Pratt, Reilly, and Schweihs 2000). The primary disadvantage of the asset approach is the time and cost required to determine and appraise all assets (tangible and intangible) and liabilities for the entire firm. This would require appraisers of different specialization, thus becoming cost prohibitive for larger

and complex firms. However, such an undertaking can pinpoint the strengths and weaknesses of the firm, and potentially help improve the firm's market value.

ANALYSIS FOR INVESTORS AND STAKEHOLDERS

In the past few years, numerous mergers and acquisitions have taken place within the chemical industry. These include Akzo Nobel's purchase of ICI for £8 billion, Basell acquisition of Lyondell for $19.4 billion, and Dow Chemical's latest attempt to acquire Rohm & Haas (Ovrebekk 2008). A merger or acquisition between firms should be used as a strategic tool and a long-term proposition (Godfrey 2009). Between recognizing a potential M&A and fully integrating into a single enterprise, numerous factors can play a role in determining the success or failure of the deal. It is crucial for management to know what they are buying and what they are getting themselves into (Perry and Herd 2004). Due diligence with a clear strategic reason for the merger and an understanding of the economic run-up of purchases can assist investors and stakeholders from an ill advised acquisition.

Reason for the Deal

M&A's have had numerous roles in the chemical industry. These include strengthening existing product line through new capabilities and extending into new geographic markets, and developing successful operations in advance of the competition (Weston, Johnson, and Siu 1999). Before any decisions are made concerning a merger, business leaders need to determine the strategic rationale for the deal as it relates to the

corporate goals. Often times the basis include benefits of scale, scope, and competitive advantages. In 2005, the sale of Basell by BASF and Shell to Nell Acquisition for €4.4 billion, and the purchase of GE Plastics by Saudi Basic Industries (SABIC) in 2007 for $11.6 billion were for the capital intensive polymers class, providing access to raw materials and economies of scale to become cost efficient (Jones 2007).

Every deal should address the challenges associated with the corporate goals (Gadiesh, Ormiston, and Rovit 2003). Leaders should begin by asking themselves basic questions relating to their business and what they hope to achieve through the acquisition. Management should understand the capability of its business, and its ability to successfully execute the merger. Business leaders should also determine the present business cycle as well the timing analysis for the deal (due to possible market downturn). This will allow the leaders to forecast any possible changes (i.e. market and competitive behaviors) during the course of the merger which may impede achieving their goals (Jones 2007). While the chemical industry is known for its relative long investment cycles and payback periods, investors have aggressively driven chemical mergers to higher prices, and financed and leveraged deals at aggressive levels. This has worried some observers of the increased risks of default during a downward business cycle (Jones 2007).

One year after the merger between Lyondell and Basell, a group of creditors sued the lenders, executives, and former board of Lyondell Chemicals for driving the company into bankruptcy. According to the lawsuit filed by the creditors, the merger focused on the million dollar payouts (to corporate executives and directors) despite signs that the company would go bankrupt in an economic downturn (Greenwood 2009). Creditors

state that Merrill Lynch helped produce inflated projections, stating that the merged company could survive a downturn while carrying debt in excess of $20 billion. The lawsuit states that Leonard Blavatnik, owner of Access Industries, was driven to pursue the deal since it would be financed entirely by debt – placing no risk on his own money (Greenwood 2009). After Blavatnik failed to acquire GE Plastics and Huntsman in 2007, he was determined to acquire Lyondell at any price. The lawsuit states that leading analysts predicted a downturn in the petrochemical industry, and the prospect of the merger even worried Blavatnik's executives; Basell CEO Volker Trautz had opposed the deal (Greenwood 2009). Poorly supported mergers will fail to reach projected performance due to management falling in love with the deal. The numbers will be stretched to fit the rationale, making the projections difficult to realize (Godfrey 2009).

Leaders should announce the intention of the deal once the strategic reason is determined, and an analysis of the target firm is completed. Leadership team to drive the merger should be formed to answer basic questions for the stakeholders including: What is the purpose of the deal? Who will be driving the deal? How will it affect the stakeholders?

Valuing Synergy

One of the primary justifications for the premium paid is the synergy formed through the merger. The premium for the Takeda/Millennium deal was 53% and Dow Chemical was willing to pay a 70% premium for the takeover of Rohm & Haas. Paying a high premium can be justified if the synergies are captured, either through cost synergies

or revenue synergies (Hornke 2009). As mentioned above, revenue synergies are often difficult to capture, and thus calculations are based on cost synergies since they are easier to estimate using the information available during the deal (Early 2004). However, if the synergies set forth during the negotiations cannot be captured after the merger, an unjustified price was paid for the deal. The targeted cost synergy in the Roche/Genentech deal was $750 – 850 million and €240 – 260 million for the Henkel/National Starch deal. Since these and other targets were produced prior to the 2008 economic downturn, firms are under pressure to capture the targeted cost synergies since revenue synergies are unlikely (Hornke 2009).

Financing the Deal

Since the late 1990s, there has been some correlation between the Dow Jones index and the overall value of M&A transaction within the chemical industry for deals greater than $50 million, as shown in figure 2.

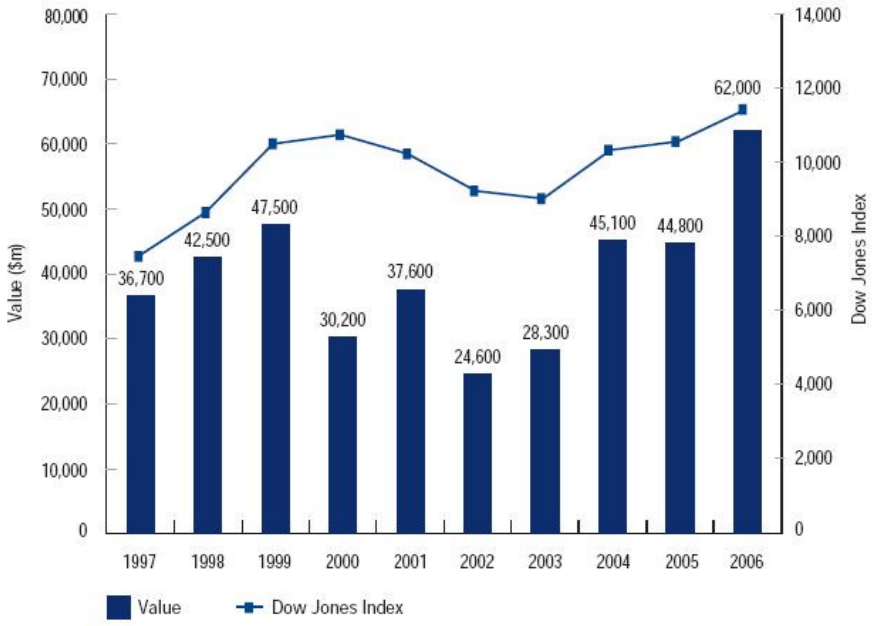

Figure 2: M&A deals versus the Dow Jones Index (Jones 2007).

The overall value of chemical M&A transactions grew as the Dow Jones index performed positively (Jones 2007). In response, excess liquidity in the debt market has prompted many financial institutions to lend money. High liquidity has brought investors from the Middle East, India, and China to participate in the European chemicals M&A market. Chinese companies have been interested in gaining technological benefits, whereas India is seeking to enter new markets. As a result of the high liquidity, the level of equity required to finance a deal has decreased significantly from 40% to 25%

Chemical companies have also attracted private equity (PE) houses due to its high level of profitability, the ability to exit from the investment, and the cash position and cheap assets of the chemical firms (S.A 2007). Basell was once purchased by an investment firm whose plan was likely to exit the investment once Basell had attractive

levels of profitability (Jones 2007). PE firms have also increased M&A's within the chemical industry, and thereby increasing the enterprise value. In 2007, PE deals jumped to 9.9x EBITDA from 6.1x EBITDA in 2001; multiples stayed high due to stiff bidding from PE's (Chu 2008).

The main difficulty within the chemical industry is understanding the complexity of the business model (Chu 2008), and the limited resources to understand the business model and cycle within the chemical industry (Jones 2007). The long payback and investment period in the chemical industry has become financially risky for many PE firms. This risk becomes even more apparent when the market cycle indicates a downward turn, preventing PE firms to exit the investments (S.A 2007).

Cyclicality is regarded as constant challenge within the chemical industry. Cash flow require accounting for the financing cycles which affect the price an investor is willing to pay for the assets (KPMG 2007). As a result, market experience and an overview of the cycles are required to foresee business cycles. The latest run-up of chemical M&A activities and valuation is a result of excess liquidity. Therefore, it is critical to determine what added value a target firm can bring to a buyer. A common mistake is failing to evaluate the target's future growth rate and profitability against changing conditions in the economics and competitive environments. Forecasting an unrealistic growth rate can have consequential effects in the target's valuation (Perry and Herd 2004). The price paid for the acquisition should be based upon achievable synergies and value added to the buyer in context of the changing business cycle.

Due Diligence

Due diligence refers to the commercial analysis conducted by a potential buyer to gain an understanding of what is purchased from the target firm. This process seeks to identify issues which may leverage the asking price for the target firm (Godfrey 2009). Issues including business performance, risks, legal, and compliance can reveal strengths and weaknesses of the firm for which the acquirer will be responsible. From the cyclicality of the business to the complexity of the production sites, potential buyers face numerous challenges in identifying potential value and risks of the target firm (Jones 2007). However, proper due diligence can better inform the acquirer on what is being purchased.

One of the challenges involved with the due diligence process is that it is often handled by consultants comprised of lawyers and accountants who do not have a technical or commercial experience in the chemical industry (Godfrey 2009). As a result, an analysis is made without the consideration of critical factors affecting the chemical firms. Therefore, the investigation should be performed by industry experts with proven track records who are able to quickly identify areas which may hurt the acquirer.

Due diligence process requires time and money which are not recoverable if the transaction should fail. As a result, the process generally begins when exclusivity to the deal is provided, and the due diligence process begins after the lawyers and accountants have been appointed, causing duplicate work and poor control on the due diligence process (Godfrey 2009).

The due diligence process should be properly executed to avoid hidden surprises after the deal has been signed. Ample time should be provided to complete the due

diligence process. Sellers will attempt to arrange for a narrow timetable for the deal, pressuring buyers into setting high bids without proper due diligence. Such situations require neutral third parties to prevent further progress of the deal until the due diligence is complete. The process should rely upon publicly available data, as well as information collected from on-site visits and data rooms. Once this process is complete, the buyer will have the necessary information to make a decision and offer for the M&A.

METHODOLOGY

The methodology of this research began by researching on the justification for M&A's. Further examination was conducted on the inherent challenges in the consideration of M&A as well as possible measures to avoid overpriced M&A. Following this study, research was done to understand the valuation techniques available to estimate the value of a company. Various variations in the valuation techniques exists, however emphasis was placed on understanding the basis of common valuation techniques. An analysis was then performed on M&A activities within the chemical industry by focusing on reasons for recent M&A's and valuations of chemical firms. Due diligence process was researched for investors and stakeholders interested in M&A within the chemical industry. Throughout this research, there was a focus on answering two questions. The first question was 'what factors influence the decision for mergers and acquisitions.' The second question was 'what valuation techniques and practices are available to measure the appropriate price for an acquisition.' Thus this research focused on the rationalization for M&A's and the appropriate price for such deals. Research for

this topic was found from various sources. These included books, articles from magazines, internet, and previous case study. The information gathered was organized to present the reasons and valuation techniques for M&A's, and factors for recent chemical M&A's.

CONCLUSION

The current global competitive environment has led many companies to pursue M&A's. One of the primary motives is to capture synergy through reduction in duplicate work, joint efforts, and improved processes and knowledge sharing. The difficulty exists in accurately estimating the monetary value added through the merger, and achieving the synergies set forth. Companies also see M&A as a quick approach for growth and competitive advantages. Through such measures, firms are able to quickly reach expanded customer base and enter into new geographic regions. Often times M&A deals are reached due to management questionable reasoning. Management should subjectively analyze the costs and benefits associated with any M&A deal. Deals should only be pursued if the value added to the firm outweighs the associated cost.

There are numerous methods available to prevent decision-makers from an overpriced acquisition. The commonly used technique is the discount cash flow which estimates the present value of a target firm based on future cash flow. The market multiple estimates the value of a firm based on comparisons of similar firms. Asset valuation simply calculates the net worth of a firm based on liquidation of assets.

The best practice for M&A deals should begin with the due diligence process in thoroughly understanding what the buyer is acquiring. In addition, the deal should align with the corporate goals and help the firm reach these goals. Attainable synergies should

be identified and captured, and the value added to the purchaser should equate to the synergies identified. Any purchase price above the value added to the buyer should be cautioned against. Consideration should be placed on current and future economic outlook as well as the business cycle.

As the competitive environment grows stiffer, an increasing level of M&A activities will be seen within the chemical industry from developing countries such as India and China. Greater number of companies from the developing countries will seek M&A's with firms in the United States and Europe. The primary rationale will be for faster market growth and access to new customer base. Firm from the developing countries will also have access to new technology. With the decline in the dollar, foreign countries with a massive reserve in the dollar will have the finance available for an (overpriced) acquisition. Although a higher premium for such acquisitions will likely be paid, it may be validated from the intangible synergies these foreign firms capture, including access to newer technology, brand awareness, and market perception. An understanding of the foreign factors which can affect (the valuation of) a target firm can allow an investor to make an informed acquisition going forward.

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